

**Amendments to the Claims:**

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) Process for producing an integrally asymmetrical hydrophobic membrane consisting of at least one polyolefin, the membrane having a sponge-like, open-pored, microporous support structure and a separation layer with a denser structure compared to the support structure, the process comprising at least the steps of:
  - a) preparing a homogeneous solution from a system comprising 20-90% by weight of ~~a polymer component comprising the~~ at least one polyolefin and 80-10% by weight of a solvent for the ~~polymer component~~ at least one polyolefin, wherein the system at elevated temperatures has a range in which it is present as a homogeneous ~~solution~~ solution, on cooling has a critical demixing temperature, below the critical demixing temperature in the liquid state of aggregation has a miscibility gap, and has a solidification temperature,
  - b) rendering the solution to form a shaped object, with first and second surfaces, in a die at a die temperature above the critical demixing temperature,
  - c) cooling the shaped object by contacting the shaped object with a liquid cooling medium that does not dissolve or react chemically with the ~~polymer component~~ at least one polyolefin at temperatures up to the die temperature, the liquid cooling medium being conditioned to a cooling temperature below the solidification temperature, at such a rate that a thermodynamic non-equilibrium liquid-liquid phase separation into a high-polymer-content phase and a low-polymer-content phase takes place and solidification of the high-polymer-content phase subsequently occurs when the temperature of the shaped object falls below the solidification temperature, and
  - d) optionally removing the low-polymer-content phase from the shaped object, wherein a solvent for the ~~polymer component~~ at least one polyolefin is selected for which, on

cooling at a rate of 1°C/min, the demixing temperature of a solution of 25% by weight of the ~~polymer component~~ at least one polyolefin in the solvent is 10 to 70°C above the solidification temperature.

2. (Currently Amended) Process for producing a membrane according to claim 1, wherein the solvent for the at least one ~~polymer~~ polyolefin is one for which, for a solution of 25% by weight of the ~~polymer component~~ at least one polyolefin in the solvent and a cooling rate of 1°C/min, the critical demixing temperature is 20 to 50°C above the solidification temperature.

3. (Currently Amended) Process for producing a membrane according to claim 1, wherein the solvent for the at least one polymer is one for which, for a solution of 25% by weight of the ~~polymer component~~ at least one polyolefin in ~~this the~~ solvent and a cooling rate of 1°C/min, the critical demixing temperature is 25 to 45°C above the solidification temperature.

4. (Currently Amended) Process for producing a membrane according to claim 1, wherein the ~~polymer component~~ at least one polyolefin has a density of  $\leq 910 \text{ kg/m}^3$ .

5. (Currently Amended) Process for producing a membrane according to claim 1, wherein the liquid cooling medium is a non-solvent for the ~~polymer component~~ at least one polyolefin that, on heating up to a boiling point of the non-solvent, does not dissolve the ~~polymer component~~ at least one polyolefin to form a homogeneous solution.

6. (Currently Amended) Process for producing a membrane according to claim 1, wherein the liquid cooling medium is a liquid that is a strong non-solvent for the ~~polymer component~~ at least one polyolefin and is homogeneously miscible with the solvent at the cooling temperature.

7. (Previously Presented) Process for producing a membrane according to claim 1, wherein the liquid cooling medium has a temperature that is at least 100°C below the critical demixing temperature.

8. (Currently Amended) Process for producing a membrane according to claim 1, wherein 30-60% by weight of the ~~polymer component~~ at least one polyolefin is dissolved in 70-40% by weight of the solvent.

9. (Currently Amended) Process for producing a membrane according to claim 1, wherein the at least one polyolefin ~~contained in the polymer component~~ consists exclusively of carbon and hydrogen.

10. (Previously Presented) Process for producing a membrane according to claim 9, wherein the at least one polyolefin is a poly(4-methyl-1-pentene).

11. (Previously Presented) Process for producing a membrane according to claim 9, wherein the at least one polyolefin is a polypropylene.

12. (Previously Presented) Process for producing a membrane according to claim 9, wherein the at least one polyolefin is a mixture of a poly(4-methyl-1-pentene) and a polypropylene.

13. (Previously Presented) Process for producing a membrane according to claim 10, wherein the solvent is palm nut oil, dibutyl phthalate, dioctyl phthalate, dibenzyl ether, coconut oil, or a mixture thereof.

14. (Previously Presented) Process for producing a membrane according to claim 11, wherein the solvent is N,N-bis(2-hydroxyethyl)tallow amine, dioctyl phthalate, or a mixture thereof.

15. (Previously Presented) Process for producing a membrane according to claim 1, wherein the membrane is a hollow-fiber membrane.

16. (Withdrawn-Currently Amended) Hydrophobic integrally asymmetrical membrane made by a process according to claim 1, wherein the membrane consists ~~essentially of the~~ at least one polyolefin, has first and second surfaces and an intermediate support layer with a sponge-like, open-pored, microporous structure and adjacent to this support layer on at least one of the surfaces a separation layer, where the separation layer is dense or has pores with an average diameter  $< 100$  nm, the support layer is free of macrovoids, the pores in the support layer are on average substantially isotropic, and the membrane has a porosity in the range from greater than 30% to less than 75% by volume.

17. (Withdrawn) A gas separation process, comprising contacting a gas to be separated with the membrane made by the process of claim 1.

18. (Withdrawn) A gas transfer process, comprising contacting a gas with the membrane made by the process of claim 1.

19. (Withdrawn) An oxygenation of blood process, comprising contacting blood with the membrane made by the process of claim 1.

20. (Withdrawn) An oxygenation of blood process, comprising contacting blood with the membrane of claim 16.